

2. (Cancelled) A chemical mechanical polishing pad having a plurality of reliefs in a main polishing surface for determining wear of the pad, wherein the reliefs comprise through-holes in the pad.

3. (Cancelled) The pad of claim 1, wherein the reliefs extend partially through a thickness of the pad.

4. (Cancelled) A chemical mechanical polishing pad having a plurality of reliefs in a main polishing surface for determining wear of the pad, wherein the reliefs have a rectangular, square, triangular or round shape.

Sub 415 5. A method for measuring wear of the thickness of a chemical mechanical polishing pad, the method comprising:
providing a plurality of reliefs in a main polishing surface of the pad; and
measuring a distance from the main polishing surface to a bottom surface of each of a plurality of the reliefs, wherein the reliefs are disposed in a predetermined pattern such that the wear of the pad is determinable as a function of pad radius.

2 6. (Amended) The method of claim 5, comprising determining total pad wear based on the measured distances, wherein the measuring a distance comprises laser measurements.

Sub 415 7. (Amended) A method for measuring wear of the thickness of a chemical mechanical polishing pad, comprising:
providing a plurality of reliefs in a main polishing surface of the pad, the reliefs being disposed in a predetermined pattern;
measuring a distance by laser from the main polishing surface to a bottom surface of each of a plurality of the reliefs, wherein the pad has a radius; and
determining wear of the pad as a function of the pad radius, based on the relief pattern and the measured distances, to generate a pad wear profile.

B3 C2 Cancelled
8. (Amended) A method for measuring wear of the thickness of a chemical mechanical polishing pad, comprising:
providing a plurality of reliefs in a main polishing surface of the pad, the reliefs being disposed in a predetermined pattern;
measuring a distance by laser from the main polishing surface to a bottom surface of each of a plurality of the reliefs; and
determining a wear rate of a first portion of the main polishing surface of the pad based on the relief pattern and the measured distances.

5 10. The method of claim 7, wherein the pad wear is responsive to a process parameter, and further comprising altering the process parameter based on the pad wear profile.

6 11. The method of claim 8, comprising altering the process parameter based on the pad wear profile such that the pad wear is approximately equal at each of the reliefs.

B3 7 12. The method of claim 8, comprising polishing an article using a second portion of the pad separate from the first portion when the wear rate of the first portion is significantly greater than a predetermined value.

8 13. The method of claim 8, wherein the first portion of the pad is used to polish an article at a predetermined polishing rate, and wherein the polishing rate is responsive to a process parameter and the wear rate, the method comprising altering the process parameter based on the wear rate such that the polishing rate is maintained.

9 14. The method of claim 8, wherein the process parameter comprises conditioning of the pad.

14. (Cancelled) A chemical mechanical polishing pad having a plurality of reliefs in a main polishing surface for determining wear of the pad, wherein the reliefs comprise through-holes in the pad or extend partially through a thickness of the pad.
15. (Cancelled) A chemical mechanical polishing pad having a plurality of reliefs disposed in a predetermined pattern thereon, wherein the predetermined pattern is configured to indicate the wear of at least one region of the pad with respect to the pad radius.
16. (Cancelled) The pad of claim 15, wherein the predetermined pattern is configured to enable monitoring of the pad wear to discern whether two or more regions of the pad are wearing at different rates.
17. (Cancelled) The pad of claim 15, wherein the predetermined pattern is selected from inline, spiral, non-symmetrical pseudo-random, and combinations thereof.
18. (Cancelled) The pad of claim 2, wherein the reliefs are distributed in a predetermined pattern to enable monitoring the pad wear as a function of pad radius.
19. (Cancelled) The pad of claim 18, wherein the predetermined pattern is configured to enable monitoring of the pad wear to discern whether two or more regions of the pad are wearing at different rates.
20. (Cancelled) The pad of claim 18, wherein at least some of the reliefs are individually monitored to establish a wear pattern specific to a pattern of at least some of the reliefs.

Please add new claims 21-25 as follows:

21. (New) An apparatus for chemical mechanical polishing a substrate comprising,

a chemical mechanical polishing pad having a plurality of reliefs in a main polishing surface for determining wear of the pad, wherein the reliefs comprise through-holes in the pad or extend partially through a thickness of the pad; and

means for measuring a distance from the main polishing surface to a bottom surface of each of the plurality of reliefs.

11/ ~~22~~ (New) The apparatus of claim ~~21~~¹⁰, wherein the means for measuring a distance comprise a laser probe.

13/ ~~23~~ (New) An apparatus for chemical mechanical polishing a substrate comprising, a laser probe; and
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11/ ~~24~~ a chemical mechanical polishing pad having a plurality of reliefs disposed in a predetermined pattern thereon, wherein the predetermined pattern is configured to indicate the wear of at least one region of the pad with respect to the pad radius.

13/ ~~24~~ (New) The apparatus of claim ~~23~~¹², wherein the predetermined pattern is configured to enable monitoring of the pad wear to discern whether two or more regions of the pad are wearing at different rates.

11/ ~~25~~ (New) The apparatus of claim ~~23~~¹², wherein the predetermined pattern is selected from inline, spiral, non-symmetrical pseudo-random, and combinations thereof.

REMARKS

This Preliminary Amendment is intended to clarify the invention and does not constitute new matter. Please consider the claims pending in the application for reasons discussed below.

Claims 5-13 and 21-25 are pending in the application following entry of this amendment. Claims 1-4 and 14-20 have been cancelled without prejudice. Claims 5-13 stand rejected from the Final Office Action, dated June 25, 2002, and will be discussed below. Claims 21-25 have been added to more clearly claim an aspect of the invention.